Working the ISS Repeater with a Baofeng UV5R

The ISS Cross band Repeater is usually active. See [1] for the current status.

I noticed recently that there were overhead passes in the early afternoon and wondered if my Baofeng UV5R would be able to hear anything and even be able to get a signal through the repeater.

1) Tracking: Using my cheap Android phone I found that "Look4sat" was the best of the many apps available. [2]

This one is a bit tricky to get running but has a very useful "Countdown to AOS" feature. See Figure 1. (Look4Sat screenshot)

Figure1

2) Programming the UV5R: Clint Bradford K6LCS gives lots of hints on his web site [3].

I used "Chirp" to program my UV5R [4] and you can see my Chirp file here [5].

Use the “Baofeng\_UV-5R\_20200927.img” to program the UV-5R using Chirp.

You can set up the frequencies manually using 5 Channels to cover the Doppler shift.

Ch1 Rx 437.810 Tx 145.99 with 67 HZ CTCSS tone (for start of pass AOS)

Ch2 Rx 437.805 Tx 145.99 with 67 HZ CTCSS tone

Ch3 Rx 437.800 Tx 145.99 with 67 HZ CTCSS tone (for mid pass)

Ch4 Rx 437.795 Tx 145.99 with 67 HZ CTCSS tone

Ch5 Rx 437.790 Tx 145.99 with 67 HZ CTCSS tone (for end of pass LOS)

3) Results: I used the stock UV5R antenna not expecting to hear much but about 5 minutes into the pass, I heard a couple of VKs chatting. Then ZL2TAZ came up and worked a couple of stations and finally the CW ID NA1SS. All signals were a bit noisy but quite readable.

I didn't seem to be able to get in on transmit.

You need full duplex to be able to hear yourself and know if you are getting in.

Conclusions: The Baofeng UV5R will work but needs a better antenna than the standard whip.

A proper Dual Band mobile would be a better choice for a radio to provide full duplex operation.

Horizon obstruction and low signal levels means that “Look4sat” appears to be early by a few minutes but checking with “GPredict” on the main PC shows that it is giving the correct access times.

I also wrote up a quick spreadsheet to check the theoretical performance which is also in GitHub [5] ( ISS CrossBand Repeater\_Path Calcs).

References:

[1]: ARISS Current Status <https://www.ariss.org/current-status-of-iss-stations.html>

[2]: Look4Sat App < https://f-droid.org/en/packages/com.rtbishop.look4sat/>

[3]: Clint Bradford web site < https://www.work-sat.com/>

[4]: Chirp web site < https://chirp.danplanet.com/projects/chirp/wiki/Home>

[5]: GitHub repository <https://github.com/TerryOz/ISS-Crossband-Repeater-with-UV5R>

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